

Progress Report:

**A LANDSCAPE APPROACH
TO GRASSLAND BIRD CONSERVATION
IN THE PRAIRIE POTHOLE REGION
OF THE NORTHERN GREAT PLAINS**

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Project Description: The goal of this project is to develop breeding bird models/maps which link bird population density to local and landscape habitat features. Maps/models will be used to guide management decisions by predicting landscape capability to attract grassland birds, determining treatments required to meet habitat requirements, and predicting improvement in bird population status. This project is part of a large, multi-state (MN, IA, SD, ND, MT) effort to conserve grassland birds throughout the Prairie Pothole Region of the U.S. This report summarizes our progress to date, with the promise of providing final mapping products and publications in 2007 (Table 1 lists funding partners).

Table 1. Funding partners

Neotropical Migratory Bird Conservation Act
Minnesota Department of Natural Resources
North Dakota Game and Fish Department
Region 3 HAPET Office (Minnesota) / U.S. Fish and Wildlife Service
Region 6 HAPET Office (North Dakota) / U.S. Fish and Wildlife Service
University of Montana
Iowa State University / Iowa Cooperative Fish & Wildlife Research Unit
Iowa Department of Natural Resources
The Nature Conservancy
Wildlife Habitat Management Institute*

**We're fortunate to have a new funding partner in 2003, the Wildlife Habitat Management Institute. This research arm of the Natural Resources Conservation Service (NRCS) sees the importance of this project in providing conservation planners and managers with decision support tools necessary to direct habitat conservation initiatives for grassland birds across regional scales. We've agreed to train and assist NRCS field agents in utilizing our proposed habitat planning maps to best implement grassland bird conservation strategies on the ground once the project has been completed.*

Vehicle Use Partnerships: Field season expenses were dramatically reduced by various USFWS offices allowing us free use of their vehicles from May through mid-July. (Fueling and insurance were provided through project funds through The University of Montana). We extend great appreciation to these offices and personnel for generously providing us with field vehicles (Table 2):

Table 2. Vehicle use partners

Crosby-Lostwood Wetland Management District (Todd Frerichs and Fred Giese)
Missouri River Fish and Wildlife Management Assistance Office (Steve Krentz and Ronald Reynolds)
Medicine Lake National Wildlife Refuge and Wetland Management District (Elizabeth Madden and Ted Gutzke)
Audubon National Wildlife Refuge and Wetland Management District (Pete Smith and Mike McEnroe)
J. Clark Salyer National Wildlife Refuge and Wetland Management District (Bob Howard)
Sand Lake National Wildlife Refuge and Wetland Management District (John Koerner)
Huron Wetland Management District (Harris Hoistad)
Region 3 HAPET (Rex Johnson)
Devils Lake National Wildlife Refuge and Wetland Management District (Will Meeks)

Work Completed in 2002: **In 2002 we procured funding, hired 2 graduate students and conducted a pilot field season.** Funding and match contributions have all been contracted through the University of Montana. The two graduate students are Frank Quamen (PhD student at the University of Montana) and Shane Patterson (MS at Iowa State University with Rolf Koford). In 2002, Frank and Shane conducted a pilot field season in northwest North Dakota (Frank) and west central Minnesota (Shane). Objectives of the pilot season were to 1) evaluate optimal time of day and seasonal timing for surveys, 2) investigate how long individual surveys should be conducted, 3) evaluate bird detectability issues to settle on a suitable radii for fixed-point counts, 4) finalize vegetation measurement protocols and most importantly 5) evaluate how many times to visit individual points.

To address these questions, we surveyed birds (for 15 minutes each) at 75 points (40 in ND, 35 in MN) 7-8 times 10 May – 25 July. An equal number points were located

in idled and native grazed grasslands, and haylands. Visits were staggered according to time of day and Julian date. Data plots indicated that surveys in 2003 be conducted from sunrise to 1000 hours 15 May – 4 July to coincide with peak bird activity. Pilot data also indicated that surveys be conducted for 10 minutes, a time that coincides with most other published literature. Program DISTANCE output indicated that distance information be collected for each bird surveyed out to 100 m from the center of the point. After removing point count data that fell outside these criteria, we conducted Poisson and Monte Carlo simulations on the remaining data to ask the question “Is it better to survey a few points many times or should we sample more points once?”. This is a key question in estimating sample sizes, evaluating whether we could adequately cover the study area with sample points and still detect enough individuals to construct landscape models for a suite or 16 species. Pilot season data indicate that a large number of sites must be visited to detect rare species of highest management concern (e.g., detections are low for Sprague’s Pipit, Baird’s Sparrow, Chestnut-collared Longspur, etc.; Figure 1). Data further indicate that on average, detection rates increased <5% for rare species when sites were visited twice (versus once). For more abundant species (e.g., Savannah Sparrow, Bobolink, Clay-colored Sparrow, etc.; Figure 2), detection rates on average increased 7-9% when sites were visited twice. Clearly, a large number of sites must be visited to ensure enough detections to construct models for species that are less than common (10% occurrence rate is our target). Using this information, we maximized sample size in 2003 by surveying a large number of sites once ($n = 1,384$), and small sub sample of sites twice ($n = 85$) to further investigate this sampling question. We thank the Crosby-Lostwood Wetland Management District for providing housing and transportation during this pilot year. Assistance and advice were generously provided by Todd Frerichs, Robert Murphy, Elizabeth Madden, Karen Smith, Todd Grant, and Melvin Nenneman (all USFWS employees).

Work Completed in 2003: In 2003, we constructed our sampling design using satellite imagery, contacted over 1,500 landowners to gain access to private lands, hired 8 field technicians and completed surveys at 1,384 sites. Biologists from HAPET offices in Regions 3 (Diane Granfors, Fergus Falls, MN) & 6 (Mike Estey, Bismarck, ND) partnered with us to locate sample points (Figure 3). Point locations are stratified by geographic region, area of grassland in landscape and habitat type. We used wetland management districts to distribute points proportional to district area. Within districts, we buffered each 30-m pixel of land cover to estimate total grassland area (i.e., all types of perennial herbaceous vegetation) within a 1600 m buffer. Total grassland area in the landscape was used to embed points into high, medium and low grassland landscapes. Points were stratified into 3 habitat types in following proportions: grassland (30%), undisturbed grassland (30%) haylands (30%) and agricultural lands (10%). All points within a habitat type are spaced >2 km apart to maximize spatial independence.

Simple random sampling of points in agricultural landscapes yields little information about bird use of the few remaining grassland landscapes. Thus, an equal allocation of points among landscapes with 0-100% grassland cover is necessary to maintain confidence intervals in regression analyses. With the aid of remotely sensed land cover, we have achieved an equal allocation of sample points that will allow us to

incorporate total grassland area as a predictor of grassland bird distribution and abundance. We plotted the distribution of our sample and that of the Breeding Bird Survey data (for the same study area) against total grassland area (Figure 4). Although landscapes with >20% grassland area are less abundant, our sampling design allows us to sample these with equal intensity.

Once the sample was completed, we contacted landowners via telephone and mail to gain access to points on private lands. We maintain a database of how many landowners granted access, their geographic location, and reasons for negative responses. In 2003, >89% of landowners granted access. We hired 8 field technicians to conduct bird surveys. We also established a Memorandum of Understanding with the U.S. Fish and Wildlife Service. Essentially, the Service provided 10 vehicles for use in this study. In return, the study paid for fuel and maintenance costs. The study also purchased pro-rated liability insurance through the University of Montana to cover technicians (no accidents occurred).

Thank you to our following 2003 field technicians:

Ashly Steinke - University of Wisconsin - Stevens Point
Christian Schultz - South Dakota State University
Jeremy Guinn - North Dakota State University (PhD candidate)
John Csoka - University of Montana
Justin Fletcher - Kansas State University (graduate)
Katy Patterson - Iowa State University (graduate)
Keenan Zeltinger - Iowa State University
Matt Haas - University of Minnesota

We completed the 2003 field season in July. The two graduate students have returned vehicles to their respective U.S. Fish and Wildlife Service offices. We have just concluded entering data from the field season into spreadsheets and statistical packages. We will send annual updates in December to all partners and final products will be delivered in 2006-07 at project's end. Please contact David Naugle with questions.

Thank you to our funding and vehicle support partners! We appreciate your partnership in 2003. We request your continued support in 2004 by asking for similar agreements in the form of vehicle use. In your early planning efforts for 2004 could you please consider this project? We could not conduct this research within our budget constraints without your continued assistance. Feel free to give Dave or Frank a call if you'd like to contribute again for next field season. I'll also be contacting Wetland Management Districts within the study area to solicit vehicles in January 2004. Thanks again for your support!

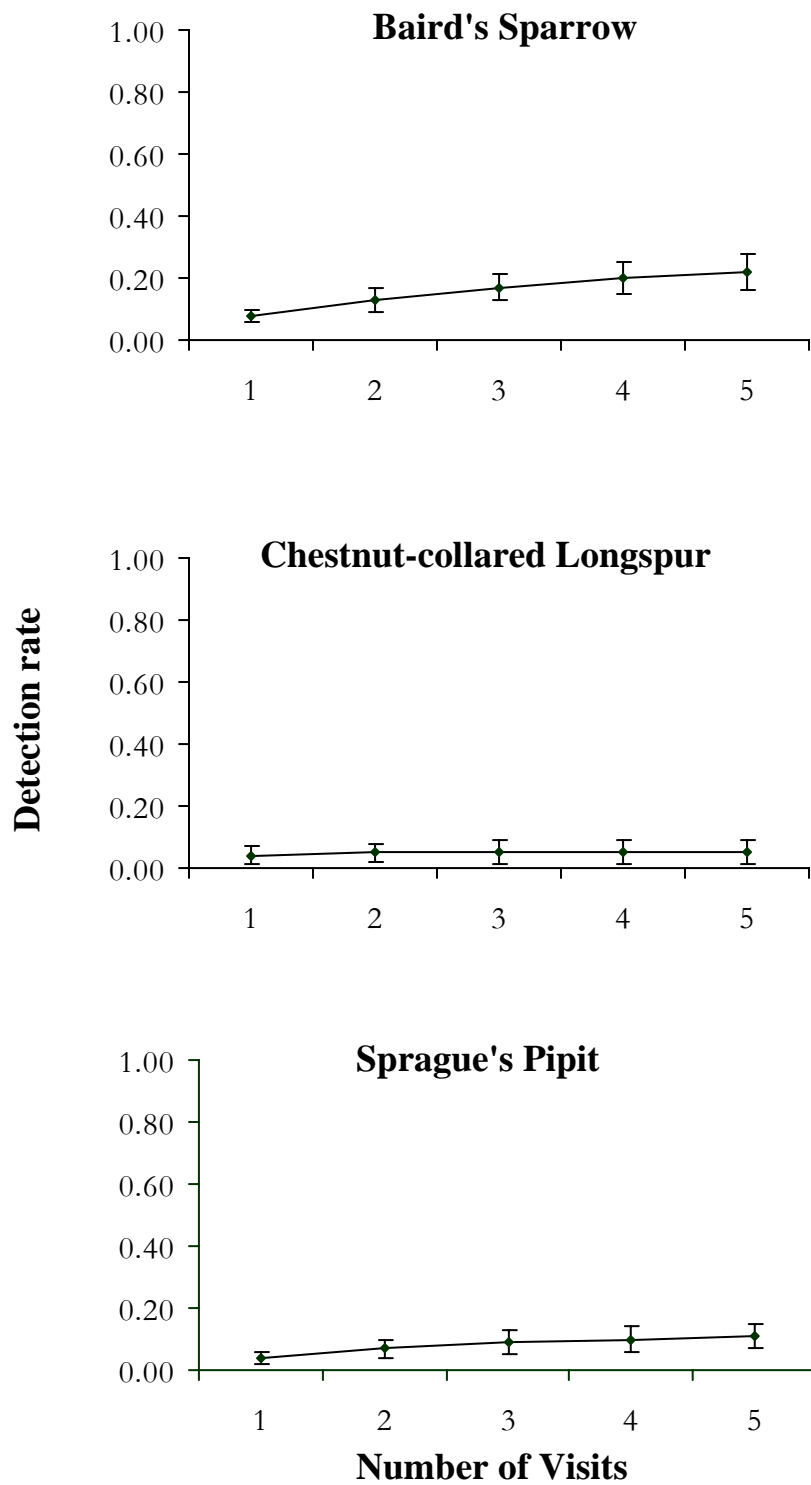


Figure 1. Poisson based detection rates of rare grassland birds based on 2002 pilot field season data in North Dakota.

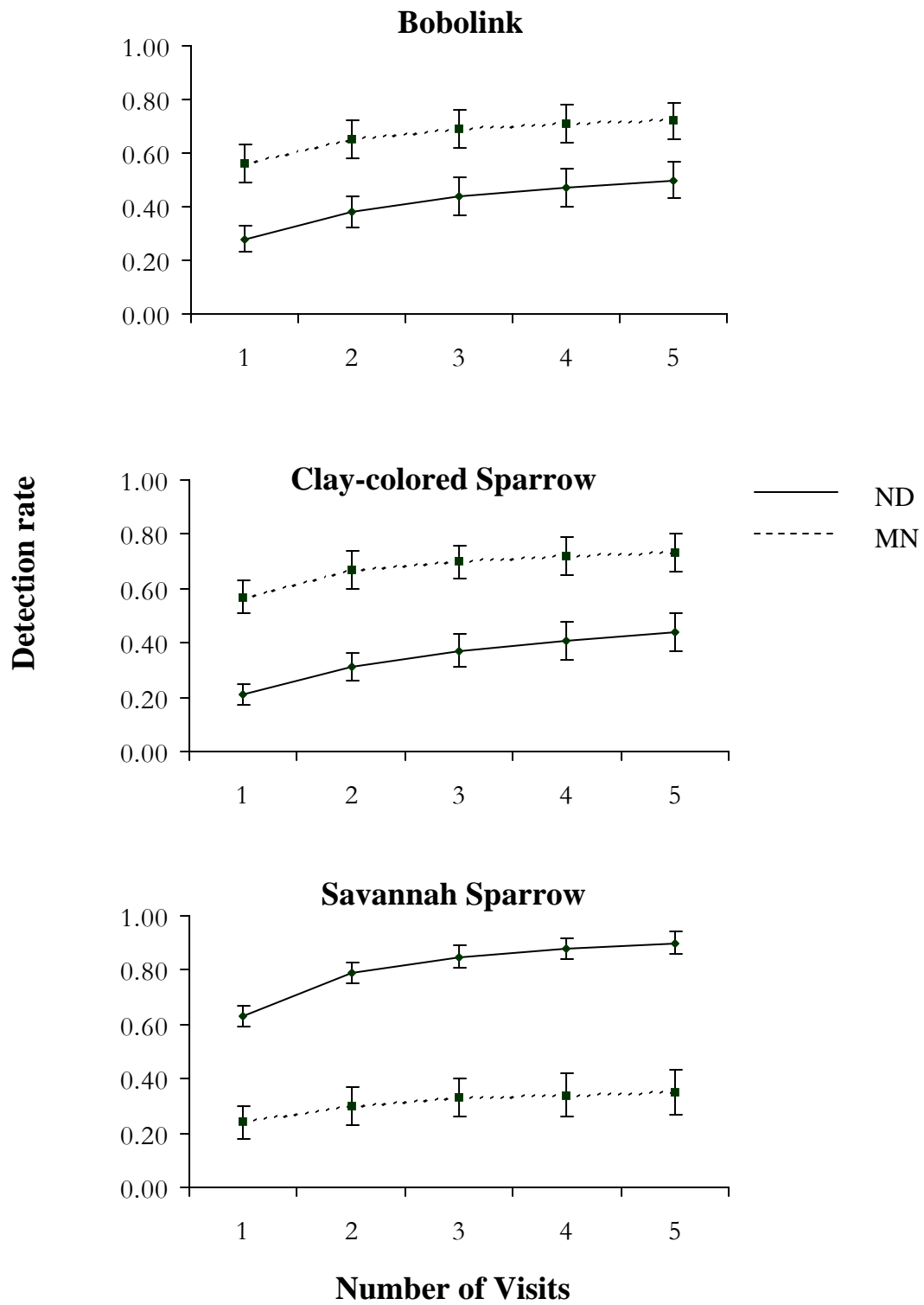


Figure 2. Poisson based detection rates of common grassland birds based on 2002 pilot field season data in North Dakota and Minnesota.

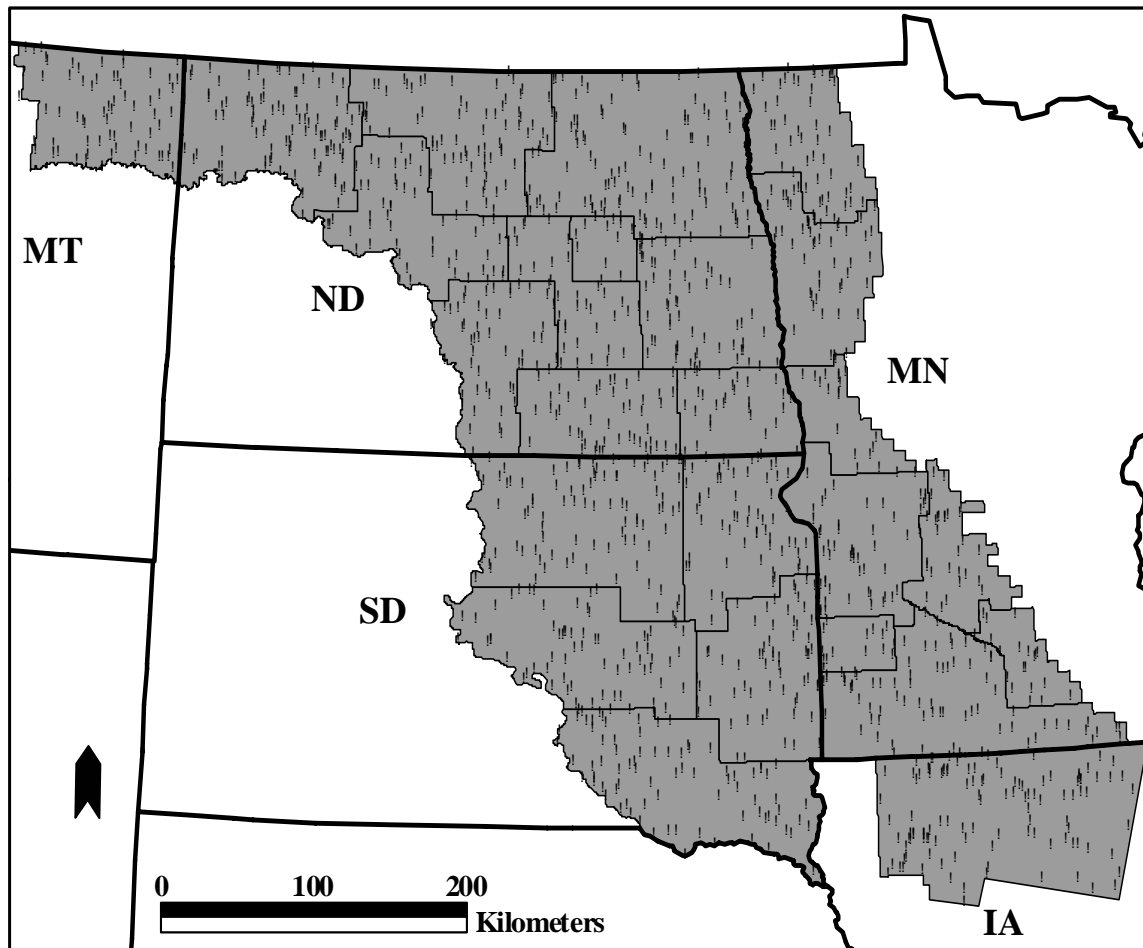


Figure 3. Grassland bird point count and vegetation assessment locations within shaded study area: 2003 field season.

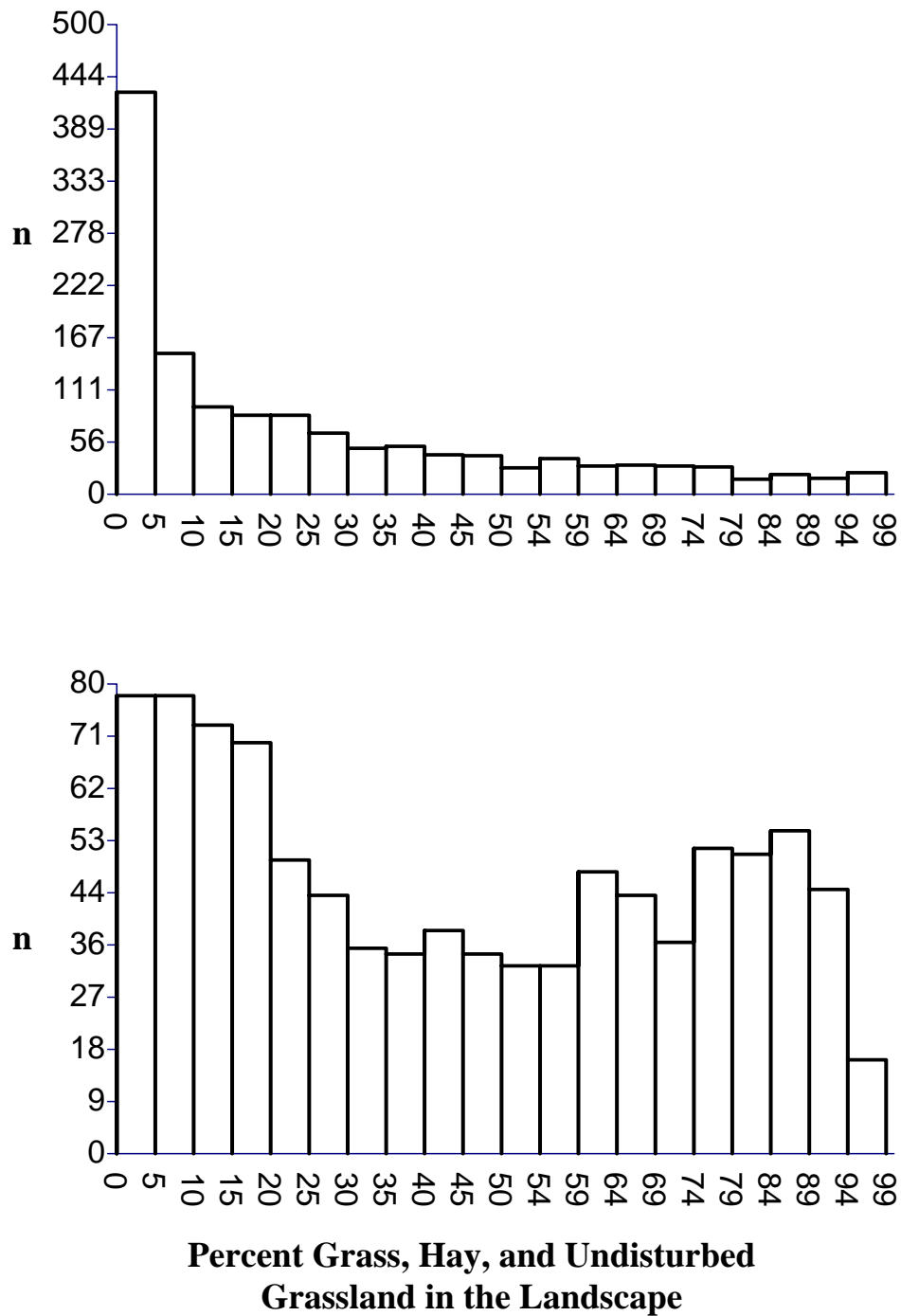


Figure 4. Histograms of percent grass, hay and undisturbed grassland in a one-mile radius buffer surrounding sample points in a) breeding bird survey points, and b) 2003 study points used in our study in the mixed-grass portion of the prairie pothole region.